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ABSTRACT

An evaluation of the extent to which research influences decision making in vocational education and training (VET) at the policy level necessitates consideration of these three areas: (1) decision making; (2) research; and (3) linkages. First, the impact of research on decision making incorporates these two elements: (1) use; and (2) influence. The study of policy-making should concentrate on analysis of the policy process, distribution of power among key stakeholders, and assumptive worlds of key individuals and organizations. Second, research should be addressed in its diversity. Its outputs are: (1) a provision of new knowledge and an application of existing knowledge in new ways; (2) research skills and attitudes; and (3) appropriately educated people. Research can be classified by type: (1) basic; (2) strategic; or (3) applied research and experimental development. Third, the impact of research on policy making is affected by linkages between research and decision making. Stressing the multiple pathways through which VET research can influence policy and practice emphasizes the importance of multiple areas of collaboration between researchers, users, and others. Conclusions are: (1) research does have an impact on decision making in VET; (2) the extent of the influence can not be evaluated quantitatively; and (3) actions of stakeholders can enhance the extent to which research is used and has influence on decision making. (Contains 20 references.) (YLB)

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Chris Selby Smith

CEET WORKING PAPER NO 24

MONASH UNIVERSITY – ACER

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The Relationships between Research and Decision-Making in Education: An empirical investigation

Introduction

Does research influence educational policy? If so, through what pathways?; and can the relationships be improved? These questions have been of interest in Australia and overseas. For example, the OECD has shown considerable interest as have North American and European commentators. In Australia, the issues have been of interest to researchers and also to decision-makers.[1]

An empirical investigation was undertaken to review the evidence for and where possible evaluate the extent of influence of research on decision-making in vocational education and training (VET). Interest was in the relationships at three levels: 'policy and planning'; 'practice and performance'; and 'community relations'; but this article is confined to the policy level. Since previous studies have shown that the relationships between research and its decision-making outcomes are almost always complex and not easily discerned, the research team from the the Monash University-ACER Centre for the Economics of Education and Training (CEET) in collaboration with the Research Centre for Vocational Education and Training (RCVET) at the University of Technology, Sydney examined the question from five perspectives.[2] Firstly, relevant literature was reviewed. Secondly, a symposium was held, to enable key issues to be identified and to draw on different perspectives and approaches. Thirdly, two quantitative surveys were conducted by RCVET: on the research studies undertaken between 1988 and 1996;[3] and on key decision-makers' use of research. Fourthly, nine case studies explored the influence of the factors identified in the literature and the symposium, in the context of particular situations. Finally, the preliminary findings were circulated to ten informed overseas experts in North America, the United Kingdom and continental Europe. The five perspectives were complementary.

A consistent framework underlay the five approaches. The idea of a one-to-one relationship between research and decision-making generally has been discredited (although individual studies can have an impact). Nevertheless, there is acceptance of differences between the research and decision-making domains and of the importance of linkages between them. Thus, reviewing the evidence for and where possible evaluating the extent of influence of research on decision-making in VET necessitates consideration of three areas: decision-making (Section 2 below); research (Section 3); and the linkages between them (Section 4). Section 5 considers whether research had an impact on decision-making in VET; the extent of that impact; and whether stakeholder actions can enhance impact. The relationships between R&D and decision-making can be considered primarily from the perspective of research; or

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1 For references see Selby Smith et al. 1998b, chapter 2.

2 See C. Selby Smith, et al. 1998b.

3 1068 'significant research activities' were identified as having commenced, 863 were described as 'research and development', 205 as 'local research studies'.

from the perspective of decision-making and action. Earlier studies indicate that the former can narrow the investigator's focus, overstating research's impact (the 'key hole' problem) and underestimating the complexity of decision-making.

Decision-making

The 'impact' of research on decision-making is defined to incorporate two elements: 'use' ie. whether the research served a particular decision-making purpose (such as to solve a problem, as a weapon in political or bureaucratic conflict, or to improve conceptual understanding); and 'influence' ie. whether the research made a difference to the decision which was made. Thus, research can be used in decision-making even if it did not have an influence, although the counter-factual may be difficult to establish. For example, the case study at the Royal Melbourne Institute of Technology concluded that the research findings 'were used in the decision-making process as though it did have an impact ... but, of course, it was going with the flow' (Selby Smith et al, 1997, Volume 2, pp. 43-55). Secondly, research can influence decisions not to act as well as decisions to act: the RMIT case study provided support for not changing existing practices. Thirdly, whether research is used or has influence may not be recognised. The RCVET survey found a low level of professed awareness of Australian VET research among those responsible for decisions, although middle-level staff were providing advice to more senior decision-makers which the former recognised was based on research information. Similarly, at the symposium industry representatives advanced information and ideas derived from research without being aware of their source.

The locus of many policy and planning decisions is at the level of national and State or Territory governments, within Ministerial offices, in departments and agencies. However, the investigation revealed that they also take place at the level of individual training providers, particularly where VET systems are more devolved, as in Victoria compared to NSW, or the degree of devolution is changing, as illustrated by the Sydney Institute of Technology case study (see Selby Smith et al, 1997, Volume 2, pp. 57-70).

The literature review, the symposium discussions and the case studies underlined that researchers should have 'suitably modest' expectations about research's contribution to policy-making. Research is only one of a number of sources of information available to decision-makers and information from all sources is only one of many inputs into the decision-making process:

> on a good day, ideas (information) may gain a hearing amid the swirl of political considerations, but it must be a very good and rare day indeed when policy makers take their cues mainly from scientific knowledge about the state of the world they hope to change or protect (Brown, 1991).

Two-thirds of the senior VET decision-makers surveyed by RCVET considered that, in reaching decisions, political and strategic considerations played the greatest role, with research-based information being used in half the cases described to support a decision already taken.

Ham and Hill (1993) argue that the study of policy-making should concentrate on analysing three areas: the policy process; the distribution of power; and the actors' assumptive worlds.

The policy process is characterised by a number of stages (see Palmer and Short, 1994; Rist, 1996); research of different types potentially can play a part at each stage. In the case study of User Choice policy-making, the Allen Consulting Group's work (ACG, 1994) was closely related to problem identification and agenda setting, while research examined in the ANTA RAC case study was linked with the subsequent policy formulation phase (Selby Smith et al, 1997, Volume 2, pp. 3-22). Research can also contribute at the evaluation phase, which provides opportunities for programme fine-tuning and adjustment to changing circumstances. Similarly, at each level of government, there are a variety of policy-making processes, which incorporate research differently. The processes can range from pragmatic policy decision-making, characterised by no systematic consultation or research (although research may be used in an ad hoc way to support one stance or denigrate another), to independent public inquiry processes, incorporating the systematic investigation of existing research and even the commissioning of new research. At the symposium it was argued that most key VET policy decisions over recent years have occurred through a 'pragmatic negotiated political approach' and that a relatively small role has been played by full public consultation and the systematic use of research. Many of the VET decision-makers surveyed by RCVET identified the complex, changing and time-pressured nature of their operating environments as an important factor in not directly considering research evidence before taking important decisions: the timeframes of research were seen to outlast those of policy-making, so that research results were often 'too late'. Relatedly, there had been substantial staff turnover, reducing the impact of accumulated knowledge, skills and attitudes.

Secondly, the distribution of power among key stakeholders can affect the likelihood of research influencing policy-making, when stakeholders vary in their use of research. VET policy-making is mediated through complex governmental structures and arrangements: for example, while the ANTA Ministerial Council (MINCO) is responsible for decisions on strategic policy, national objectives and overall priorities, State training agencies are accountable to MINCO on matters of national policy and to State ministers and Parliaments for the operational responsibilities of their agencies. A symposium participant commented on the 'myriads of committees and co-ordination arrangements ... [which] make life anything but plain'. VET is a contested policy domain: between Commonwealth and State/Territory governments; between public and private providers; and between unions and employers. The changing distribution of power among these players adds additional complexity: for example, business' influence rose and the unions' influence fell following the Howard Government's election. In such a complex and dynamic environment there are many openings for research to influence policy-making, but research's role can be overshadowed by other factors.

Thirdly, there are the assumptive worlds of key individuals and organisations. At the symposium and in the RCVET interviews State level officials said that research is 'not given a high priority'; there is 'no research culture'; 'VET policy makers are not very research literate'. Public service downsizing has reduced the role of research branches, distancing decision-makers further from research and depriving them of a valuable clearing house service. At the national level ANTA has stimulated a considerable increase in VET research, although research is not necessarily more widely used for internal decision-making. Further, ANTA tends to fund others to research VET rather than undertaking the research itself, which could affect its capacity to use research in policy development. In general, there appear to be contradictory expectations: on the one hand, that research could provide simple answers ('without caveats') to complex social phenomena; and on the other, that some organisations expect decision-makers to take responsibility for their own decisions and that seeking to

research an issue is a form of procrastination. However, RCVET's quantitative study indicated that over the study period significant shifts occurred in R&D activity which closely parallelled changes in the priorities of funding bodies.

There are three other matters. Firstly, at the level of individual training providers, in terms of the factors which affect the impact of research, symposium participants particularly stressed the increased complexity and competitiveness of the VET sector, with research, including market research, weighed up with other strategic and pragmatic factors. The increased rate of change was argued to cause a lower priority for research and the traditional VET culture, where Boud et al (1997) have argued that decisions tend to be made according to past practice, perceptions of industry needs and local constraints rather than research. However, the case studies (Selby Smith, et al, 1997, pp. 29-42 (Creek) and pp. 71-79 (Sefton and Waterhouse)), show that, in at least some provider organisations, high value is placed on the contribution to competitive advantage of research information, skills and attitudes. Overall, the four case studies of individual providers, while reflecting specific factors in particular contexts, underline the importance of a decision-making environment predisposed to give audience to research findings, the contributions of key individuals rather than formal structures, and the cumulative contributions from successfully applying research to decision-making.

Secondly, in recent years VET has become more closely linked to other areas of public policy. In Australia, as in many other countries, globalisation and increased international competition are leading to the closer integration of education and training policies with industry, science and technology, competition, trade and foreign policies to enhance efficiency and innovation. While the VET system has become an important element of the nation's competitiveness infrastructure, many of the main drivers of VET policy originate outside VET; and in these other areas important developments are influenced by research activity and knowledge accumulation. Thus R&D not specifically directed at VET can significantly affect VET policy and practice. Among the case studies, Sefton and Waterhouse emphasised the value of research in fields other than education for improved workplace learning: political economy, work organisation, human resources management and industrial relations. The three case studies by Creek, Jones and Trembath noted the importance of 'champions' to support research, encourage its use and develop linkages within and outside the organisation; while Dwyer showed research's influence on participating students' perceptions and decisions. Sefton and Waterhouse also demonstrated that providers with a research culture can act as mediators and advocates between workplace practice and academia. The VET system requires a capacity to translate relevant research undertaken elsewhere, from both Australian and international sources, so that it can be applied effectively in local circumstances.

Thirdly, there are indirect as well as direct links between R&D and decision-making. Community groups use research for decision-making and can influence the research agenda. Some communities, such as unions or employers, are significant stakeholders in VET and influence decisions directly (on the ANTA Board, State Training Authorities, ITABs and providers' governing bodies). Each stakeholder organisation uses R&D to advance its own interests, deploying a wide range of information, including research-based information, in their engagement with current political and policy debates. They also use research for communicating with constituents and for other purposes (eg. industrial negotiations). It is often the wider community's call for change rather than direct research evidence, that produces modifications in policy or practice: 'clamour' (Postlethwaite, 1984) can both initiate

research and be driven by it. Here, R&D has an impact on decision-making which is indirect, mediated through community activity, the media, public opinion and the political process.

Research

'Research in education, and by implication in VET, is so diverse and includes so many approaches that we are not communicating well if we just talk about 'research' with a capital 'R' (Anderson in Selby Smith, 1998a). The Australian Bureau of Statistics (ABS, 1993) defines research (R&D), by reference to the OECD Frascati Manual, as comprising 'creative work undertaken on a systematic basis in order to increase the stock of knowledge, including knowledge of man, culture and society, and the use of this knowledge to devise new applications'. Thus, R&D focuses on studies characterised by originality; it has investigation as a primary objective; and research shades into development and application. 'R&D' has three main outputs. It provides new knowledge and applies existing knowledge in new ways, including for new audiences and in new settings. Another output of research is research skills and attitudes: an approach, a way of doing things or of assessing alternative sources of information. R&D creates human capital as well as knowledge. A third output of research is appropriately educated people who are critical for both the research system and improved decision-making. Most 'impact' studies concentrate on the knowledge creation aspects of research. R&D involves an aspiration to truth; it precludes conclusions being reached before the evidence is examined or despite it (Weiss, 1991).

The OECD and the ABS classify R&D studies by type: basic, strategic or applied research and experimental development (ABS, 1993). Research in any field, including VET, can be distributed among the four types according to the motivation for undertaking the R&D. Three significant implications arose in the research study for ANTA RAC. Firstly, one would expect different *levels* of impact for the different types of research. For example, R&D which specifically addresses a current problem clearly defined by users is likely to be thought 'more relevant', particularly in the short term, than research intended to expand VET policy-makers' conceptual understanding. Secondly, one might expect different *patterns* of impact between the types of R&D in various decision-making areas. For example, national and State level policy-makers would be expected to attach higher priority to strategic research and less to developmental activities, the reverse for VET providers, because the former tend to be less concerned with detailed implementation and more with strategic questions (and conversely for training providers). These expectations were supported by the symposium discussions and the case studies. Also different patterns of R&D impact would be expected at different stages of the policy cycle eg. agenda setting compared to policy formulation, implementation or evaluation. RCVET found that, of the applied R&D studies, 37% were evaluations of programmes or practices and another 28% were to inform policy development. Thirdly, *perceptions* of use and influence tend to vary among types of R&D, because the use of some types of research is more clearly visible than others. This expectation was supported by the symposium discussions and by the RCVET survey responses. Even if a research study has impact, this may not be visible to a particular stakeholder. However, the skills and attitudes developed by the research system can be used in all decision-making settings (and in the research system itself).

The accumulative nature of R&D was stressed at the symposium and reflected in the case studies. While an individual study can have impact, this was the exception rather than the

rule: 'the one-to-one notion [of research impact on decision-making] has been scotched.' Rather, R&D was seen as contributing to a climate of opinion, providing a set of ideas and resources; at particular times, certain ideas are 'in good currency', while others are not or are no longer. Trace-back studies suggest greater research impact, particularly from basic R&D, than forward-looking studies. Viewing research 'as a process of debate' (Klein, 1990) or conceptualising a 'knowledge reservoir' (Buxton and Hanney, 1997) highlights the value of an ongoing research capacity from where decision-makers continually can draw ideas and advice.

Educational research, a subset of social science research, employs a wide range of approaches. Since different policy questions benefit from different techniques and methodologies, it is important to match the approach to the problem. Much research, especially in universities, is conducted from the standpoint of a particular academic discipline; and R&D on VET employs many disciplinary perspectives. When researchers adopt a particular disciplinary approach, it influences the problems identified, the questions posed, the techniques adopted to investigate them, the way in which results are reported and the audiences with whom researchers interact. It can also influence quality standards, a problem for some interdisciplinary studies. Fox (1990) has argued that in the USA in the 1980's, research based on 'economising values' was particularly influential and Brown (1991) agrees. A symposium participant argued that, in Australia, recent policy changes in VET can be traced to the rise of economic theories of institutions and rational actor views in the academy.

R&D is carried out in various locations: universities; other not-for-profit, specialist research organisations; within government departments and agencies; by VET providers; and in private consultancy firms. A symposium participant argued that anyone with relevant skills can carry out research and they can do it anywhere. The case studies confirm this view, however, there are advantages in carrying out particular types of R&D in the different locations. They have their own history and culture, their own incentive and reward structures, which may, or may not, encourage policy relevant research. Each location tends to specialise in particular types of research; and each produces different combinations of research outputs. For example, 'policy and economics' accounted for about 50% of the research projects undertaken within State training authorities, while virtually all the basic research found by RCVET was within universities. A consultant at the symposium commented that the 'Big 6' consultancy firms tend to concentrate at the 'D' rather than the 'R' end of the R&D continuum, that they generally synthesise existing research and are less confined to one discipline than university research. There is a balance to be struck from the overall societal viewpoint among the different types of research and, by implication, among the different locations. Recently funding has been the major mechanism for (re)directing the national research effort, to increase the linkages between researchers and users, and thus capture a greater level of economic and social benefits from the public resources invested in R&D. Researchers are responding to these incentives, somewhat blurring the distinctions between research locations.

The RCVET survey found that 'public-competitive' and 'public-commissioned' research increased between 1988-91 and 1992-96, while research activity within public-sector agencies declined. Training authorities conducted a smaller proportion of research studies in 1992-96 (26%) than in 1988-91 (43%), while the proportion rose for professional/industry bodies, including ITAB's (12.4% to 23.1%), universities (9.9% to 15.8%) and consulting

organisations (4.8% to 10.3%). The proportion of research studies in workplaces rose, while the proportion in TAFE colleges fell sharply (from 43% to 25%). RCVET classified almost two-thirds of the R&D studies located as applied research and a quarter as strategic research, but very few as basic research (almost all in universities). Universities and consulting organisations undertook 65% of the commissioned studies. RCVET also found eight programmes of research, as at CEET or RCVET, systematic attempts to build knowledge in a particular VET area, usually related to a government priority.

Different research settings tend to attract researchers with different approaches, values and interests, with implications for the research done and where it has audience. The literature suggests that researchers, especially those in universities without decision-making experience, tend to be unfamiliar with the complexities of the policy process, limiting the use of their research by decision-makers (for example, because of project choices, timeliness, format of reports and recommendations for use). Conversely, symposium participants suggested that researchers in consulting firms have particular skills in 'helping things happen' and 'in linking various resources together quickly'. Relatedly, it was claimed that some research is judged according to who performed it rather than what was done.

Three other matters arose. Firstly, the data on which the RCVET findings were based were difficult to obtain. Secondly, there was the perceived quality of VET research. In the case studies and the responses from overseas correspondents, the question was raised whether much VET research has less influence than it might because it is 'poor quality' or 'poorly communicated'. It was acknowledged that significant improvements have occurred, many stimulated by ANTA (and its former Research Advisory Council). Thirdly, it was recognised that research is not solely to provide information for decision-making, especially if the relationship is conceived as narrowly instrumental and short term. Research has other important societal purposes; it is not just the servant of decision-making (see also West, 1997).

Linkages

The impact of research on policy-making is affected by the linkages between research (and researchers) and decision-making (and decision-makers). Contact between the two domains, not only at the close of a study, but also before and during its conduct, can strongly affect impact. The contacts can even establish 'multiple areas of collaboration between the two parties which transcend the impact of a single study' (Huberman, 1990). Linkages between the two domains can be facilitated through particular institutional arrangements, key stakeholder organisations, other interest groups and the media, and mechanisms such as funding arrangements, so that linkages are conceptualised better as a 'web' or 'network' (Selby Smith, et al, 1992). To stress the concept of linkages is to be concerned with facilitating the establishment of multiple areas of collaboration between researchers, policy makers and practitioners, given the multiple pathways through which research can influence policy and practice.

The literature on the web of linkages is sparser than that on decision-making or research. Linkages have a two-fold task: to transmit information from potential users of research within the decision-making system to researchers about the R&D needed for decision-making; and to transmit to potential users information about relevant R&D which has been undertaken within

the research system. One defining characteristic of linkages is information flows: there are many forms, formal or informal, direct or indirect, long term or immediate. Although linkages are established because one party, usually decision-makers, wants to gain access to information, this presupposes that decision-makers know what they want; that researchers understand which decision-makers want what research, and when; and that researchers wish to respond and are able to do so. These conditions are frequently not satisfied.

In practice, there are often difficulties in creating and maintaining an effective web of linkages. Review of the literature reveals that firstly, it has tended to focus on linkages involving information flows, with greater recognition only recently of tacit knowledge and the movement of people. Secondly, the impact of research on decision-making tends to be greater where the linkages occur throughout the research project rather than solely at the end. Such linkages facilitate ongoing interaction and increase the likelihood of research being used; they also assist researchers to understand better the needs of decision-making. Thirdly, when research occurs in decision-making settings, whether in government agencies or at the practitioner level, the linkages between research and decision-making tend to be closer and there is a greater likelihood of external research also being taken into account (see Selby Smith et al. 1998b, Ch. 2, Section 4).

At the symposium a senior VET policy-maker argued that the linkages between research and decision-making are 'weak', 'a rickety bridge ... that isn't anywhere near as strong as it should be'. The funders of VET research have tended to focus on dissemination, 'a remote audience for research with whom communication must be established' (McGaw in Selby Smith, 1998a), rather than on linkages. This emphasis on dissemination is misplaced, perhaps based on the 'linear' model of research's relationship to decision-making. Dissemination activities are more easily identifiable, but their effectiveness is reduced when they do not operate within a strong network of linkages. Viewing dissemination as the final step of a project also has its political aspects; it can be construed as the responsibility of researchers. The national research and evaluation strategy for VET (National Centre for Vocational Education Research, 1997) recognises that narrowly defined dissemination is not, by itself, enough.

Stressing the multiple pathways through which VET research can influence policy and practice identifies the importance of multiple areas of collaboration between researchers, users and other groups. The VET system includes numerous communities, multiple pathways for use and influence, and a wide range of possible interactions and feedback. Translating ideas and concerns is not a task for researchers alone, but for all stakeholders. The stronger the linkages, the clearer the pathways of influence are likely to be and the greater the likelihood of uptake for new ideas. Linkages can also be a means of ensuring that researchers address the 'right' questions. The web of linkages includes both formal and informal arrangements. Huberman (1990) has stressed formal linkages, 'sustained interactivity', for achieving instrumental change; informal arrangements can facilitate the flow of information, research skills and attitudes, and educated people. This was illustrated at the symposium and in the case studies. Symposium participants emphasised the possibilities for particular research processes to act as a linkage with policy-makers, practitioners and other users. It occurred in a number of the case studies, for example, in relation to user choice policy-making (Case Study 1) and in the development of an R&D strategy for VET (Case Study 2); and in the studies of policy-making at the Murrumbidgee College of Agriculture, Royal Melbourne Institute of Technology, Sydney Institute of Technology and Workplace Learning

Initiatives Pty. Ltd. (Case Studies 3, 4, 5 and 6 respectively in Selby Smith, et al, 1997, Volume 2). The linkages can be indirect as well as direct, for example, through the industry partners to individual firms and unions, or more diffusely through public debate, the media and community organisations. The conduct of research projects can also act as a linkage among researchers; for example, the current study involved close collaboration between CEET and RCVET. Finally, the foreign correspondents drew attention to the international dimension of the relationships between research and decision-making, since the Australian VET sector is operating increasingly in a global environment and subject to international influences. Researchers, as well as policy-makers and practitioners, interact with their overseas colleagues as well as with those in Australia, so that the potential web of linkages, aided by technological change, is expanding substantially within and across the groups.

Two other matters were raised at the symposium and by our international correspondents. Firstly, it was argued that, since there would always be significant differences between the research and decision-making communities, there was a role for research 'brokers' to facilitate the exchange of information, skills and attitudes between the producers of research and its potential users. A recent UK study of the payback from research projects identified 'policy maker involvement and brokerage, as key factors in enhancing utilisation' (Buxton and Hanney, 1994). Secondly, it was argued that the increasing tendency by decision-making organisations to outsource VET research does not remove the need to retain an integrative, translating and co-ordinating function within agencies. Training authorities can only integrate new information from research effectively if they have the skilled personnel and the capacity in-house to ask the appropriate questions, assess the evidence, and know how and when to employ it.

Three Concluding Comments

Firstly, research *did have an impact* on decision-making in VET; but not in the way that many people appeared to expect. Some research was used, but had no influence; the decision which would otherwise have been made remained unaltered. Research's purpose can be important here, as when research is undertaken to defend a position rather than change it. Furthermore, although some individual research studies were used and had influence on VET decision-making, since these individual examples may not be typical, the overall relationship between research and decision-making cannot be generalised from them. The nature of research is accumulative; individual studies add to the body of knowledge, some slightly, some more substantially. Over time, and partly in response to new research knowledge, the climate of opinion alters so that old problems decline in importance, new problems arise and the issue agenda is modified. Thus, at any given time certain ideas, approaches or ways of thinking are in 'good currency', whilst others are not or are no longer. Over time, research's main contribution may be to the 'big ideas'; and a number of the big ideas preoccupying senior VET decision-makers during the study period, such as greater attention to the demand side and training markets, were grounded in research. Further, the outputs of the research system, in addition to information, include research skills and attitudes, and trained personnel, which contribute to both the research and the decision-making systems and to the linkages between them. Human capital's contribution to improved decision-making was clearly demonstrated in the case studies, but was largely overlooked by policy makers at the symposium and underestimated by decision-makers in their survey responses.

Secondly, the extent of research's influence on VET decision-making did not prove possible to evaluate quantitatively (it was positive but less than unity). There are many different types of research; they can be used in a wide range of decision-making contexts; they have varying levels of visibility to the different stakeholders; and different policy problems benefit from different research techniques, approaches and methodologies. *A priori*, one cannot conclude which types of research are used and have influence more than others: it depends. Also, the extent of research's use or influence cannot be determined by considering the research system alone, since it depends critically on the circumstances of decision-making in a particular context and the linkages between research and decision-making there. There are many potential uses of research in VET decision-making. In practice, since formal research evidence is often supplemented by local experience and knowledge, the extent of research impact is affected by the knowledge, attitudes and experience of the decision-makers.

Thirdly, the actions of stakeholders can *enhance* the extent to which research is used and has influence in decision-making. Researchers have obligations to be committed to the research enterprisem to keep up to date in their field to maintain the quality of their work and to be willing to engage with their broader communities. Decision-makers have an obligation to be engaged with the world of ideas and to think, read and participate in intellectual debate. They have a responsibility as professionals to develop their own human capital. Incentive structures can encourage appropriate behaviour by researchers and decision-makers. Since a substantial amount of VET research is now commissioned by training authorities and other users, their actions can be significant for the research system. If they emphasise 'simple answers to simple questions', encourage a belief that they want conclusions supportive of current policy, or discourage hard questions and constructive criticism, the research base for longer term improvement in VET will be weakened. An effective web of linkages requires active collaboration by both decision-makers and researchers. Contacts between the two domains, both formal and informal, not only at the close of a study, but before its commencement and during its conduct, can substantially enhance impact. The emphasis on linkages rather than dissemination alone increases the mutual responsibilities of the parties, since enduring linkages are based on sustained mutual esteem, an understanding of the potential contribution of each party, and a commitment to collaboration for the good of the system as a whole.

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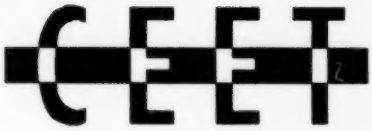

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